

## REMARKS

This is intended as a full and complete response to the Office Action dated July 3, 2003, having a shortened statutory period for response set to expire on October 3, 2003. Claims 1-95 are pending in the application and are subject to a restriction requirement. Claims 19-27 and 32-40 stand rejected. Claims 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1-18 and 41-95 stand withdrawn from consideration by the Examiner. In this response, Applicants affirm election of Group II, claims 19-40 and have cancelled claims 1-18 and 41-95 as being drawn to a non-elected invention. Applicants have also canceled claim 21 and amended claims 19, 22, 26, 32, and 37. Applicants reserve the right to prosecute the cancelled claims in a continuation or divisional application. Objected claims 28-31 have been cancelled and re-presented as new claims 96-99. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-95 stand restricted under 35 U.S.C. § 121 as follows:

- I. Claims 1-18, drawn to a substrate processing apparatus, classified in class 156, subclass 345.23.
- II. Claims 19-40, drawn to a substrate processing apparatus, classified in class 156, subclass 345.19.
- III. Claims 41-75, drawn to a substrate processing chamber adapted for electroless deposition, classified in class 118, subclass 728.
- IV. Claims 76-81, drawn to a substrate processing chamber adapted for electroless deposition, classified in class 118, subclass 722+.
- V. Claims 82-87, drawn to a semiconductor deposition system, classified in class 118, subclass 719.
- VI. Claims 88-90, drawn to a substrate chamber adapted for electroless deposition (transducer), classified in class 118, 722+.
- VII. Claims 91-95, drawn to a multilevel chamber adapted for electroless deposition, classified in class 118, subclass 719.

The restriction requirement states that inventions I and II, inventions I and IV, inventions I and V, inventions I and VI, inventions I and VII, inventions II and III,

inventions II and IV, inventions II and V, inventions II and VI, inventions II and VII, inventions III and IV, inventions III and V, inventions III and VI, inventions III and VII, inventions IV and V, inventions IV and VII, inventions V and VI, inventions V and VII, and inventions VI and VII are related as subcombinations disclosed as usable together in a single combination. Inventions III and I and inventions IV and VI are related as combination and subcombination. Applicants affirm election of Group II, claims 19-40 with traverse and reserve the right to pursue the non-elected claims in a divisional application.

Claims 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In this response, claims 28-31 have been cancelled and re-presented as new claims 96-99 with claim 96 in independent form. As a consequence, Applicants respectfully submit that the objection has been obviated and respectfully request allowance of the claims.

Claims 19-25 and 35-36 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,557,785 (*Ohkuma*) on grounds that *Ohkuma* discloses the claimed invention. Applicants respectfully traverse this rejection on grounds that *Ohkuma* does not teach, show, or suggest an evaporation shield forming a gap with respect to a substrate in which the thickness of the gap is between about 0.5 millimeters and about 4 millimeters.

*Ohkuma* discloses an apparatus for wet processing of a substrate, such as washing or etching a substrate. The apparatus includes a pedestal 11 and a cover 12 forming a circular processing chamber 13 to house a substrate 14. (See, Fig. 3A; col. 3, lns. 1-4.) The cover 12 includes an opening 20 in which processing liquid is poured or sprayed over the surface of the substrate 14. (See, Fig. 3A; 42-61.) The pedestal 11 includes angled nozzles 16 providing a jet stream of processing liquid to rotate the substrate. (See, Fig. 3A; col. 3, lns. 26-40.) The cover 12 comprises several exhaust openings 21 on the periphery of the cover 12 to discharged used processing liquid. (See, Fig. 3A; 42-61.) *Ohkuma* is silent on the distance between the cover 12 and the substrate. As a consequence, *Ohkuma* does not teach, show, or suggest an evaporation shield comprising a fluid retaining surface and adapted to form a gap with

respect to the substrate in which the thickness of the gap is between about 0.5 millimeters and about 4 millimeters. Applicants respectfully request withdrawal of the rejection.

Claim 26 stands rejected under 35 U.S.C. § 103(a) over *Ohkuma* in view of U.S. Patent No. 4,821,675 (*Ikeno et al.*) on grounds that it would have been obvious to have provided an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus in *Ohkuma* in order to restrain temperature variation of the fluid as taught by *Ikeno et al.* Applicants respectfully traverse this rejection on grounds that the neither references, alone or in combination, teach, show, or suggest a movable evaporation shield adapted to heat a fluid layer.

*Ohkuma* discloses an apparatus for wet processing of a substrate, such as washing or etching a substrate. The apparatus includes a pedestal 11 and a cover 12 forming a circular processing chamber 13 to house a substrate 14. (See, Fig. 3A; col. 3, Ins. 1-4.) *Ikeno et al.* discloses a color filter dyeing apparatus comprising an upper lid 11 in engagement with the dyeing solution receptacle 2. (See, Fig. 5; col. 4, Ins. 67 to col. 5, ln. 3.) A heater 6 is buried in the side part of the dyeing solution receptacle 2 and a heater 9 is buried on the lower surface of the dyeing solution receptacle 2. (See, Fig. 5; col. 4, Ins. 62-67.) A heater may also be mounted to the upper lid 11. (See, col. 2, Ins. 65-68.) It would not have been obvious to add the heater of *Ikeno et al.* to the cover of *Ohkuma* to arrive at the claimed invention. *Ikeno et al.* teaches burying a heater in the stationary walls or lid 11 of the dyeing solution receptacle 2---not to a movable component. As a consequence, the combination of *Ikeno et al.* and *Ohkuma* does not teach, show, or suggest a movable evaporation shield adapted to provide heat to a fluid layer. Withdrawal of the rejection is respectfully requested.

Claim 27 stands rejected under 35 U.S.C. § 103(a) over *Ohkuma* and *Ikeno et al.* in view of U.S. Patent No. 6,039,814 (*Ohmi et al.*) on grounds that it would have been obvious to one of ordinary skill in the art to have provided an evaporation shield comprising a degassing membrane in *Ohkuma* in order to remove gas and prevent extremely damaging sound waves and/or non-uniform processing as taught by *Ohmi*. Applicants respectfully traverse this rejection. Applicants respectfully traverse this

rejection on grounds that the references, alone or in combination, do not teach, show, or suggest a degassing membrane within a chamber.

*Ohkuma* discloses an apparatus for wet processing of a substrate, such as washing or etching a substrate. The apparatus includes a pedestal 11 and a cover 12 forming a circular processing chamber 13 to house a substrate 14. (See, Fig. 3A; col. 3, lns. 1-4.) *Ikeno et al.* discloses a color filter dyeing apparatus comprising an upper lid 11 in engagement with the dyeing solution receptacle 2. (See, Fig. 5; col. 4, lns. 67 to col. 5, ln. 3.) *Ohmi et al.* discloses a cleaning vessel 4 with a degassing device 3 connected outside of the cleaning vessel 4. (See, Figs. 4-5; col. 5, lns. 14-30.) The degassing device 3 removes dissolved gas from the cleaning liquid to deliver a degassed cleaning liquid to the cleaning vessel 4. (See, Figs. 4-5.) *Ohmi et al.* does not teach or disclose a degassing device within the cleaning vessel. As a consequence, the references, alone or in combination, do not teach, show, or suggest an evaporation shield comprising a degassing membrane positioned over a substrate. Withdrawal of the rejection is respectfully requested.

Claims 32, 33, and 38 stand rejected under 35 U.S.C. § 103(a) over *Ohkuma* in view of U.S. Patent Publication No. 2003/01167176 A1 (*Rothman et al.*) on grounds that it would have been obvious to provide a transducer coupled to/disposed against the evaporation shield in *Ohkuma* in order to generate and transmit acoustic wave patterns into a medium as means of providing or enhancing a cleaning process as taught by *Rothman et al.* Applicants respectfully traverse this rejection on grounds that U.S. Patent Publication No. 2003/00116176 (*Rothman et al.*) does not qualify as prior art under 35 U.S.C. § 102.

U.S. Patent Publication No. (*Rothman et al.*) was filed on January 24, 2003. The present application has a filing date of January 28, 2002 which is before the filing date of *Rothman et al.* *Rothman et al.* claims priority as a continuation-in-part application to application serial no. 09/837,507 (U.S. Patent Application Publication No. 2001/0050096) and as a continuation-in-part application to application serial no. 10/350,489 (U.S. Patent Application Publication No. 2002/0014257). Along with this response, Applicants have included a courtesy copy of U.S. Patent Application Publication No. 2001/0050096 (*Costantini et al.*) and U.S. Patent Application Publication

No. 2002/0014257 (*Chandra et al.*). Neither *Costantini et al.* nor *Chandra et al.* discloses sonic transducers. As a consequence, it is believed that *Costantini et al.* and *Chandra et al.* are not pertinent to the present pending claims. Applicants respectfully request withdrawal of the rejection.

Claim 34 stands rejected under 35 U.S.C. § 103(a) over *Ohkuma* and *Rothman et al.* in view of U.S. Patent No. 6,224,713 (*Hembree et al.*) on grounds that it would have been obvious to one of ordinary skill in the art to have provided a submersible rod for mounting a transducer to prevent the need for bringing the transducer in direct contact with a processing solution as taught by *Hembree et al.* Applicants respectfully traverse this rejection on grounds that the references, alone or in combination, do not teach, show, or suggest a transducer coupled to an evaporation shield.

*Ohkuma* discloses an apparatus for wet processing of a substrate, such as washing or etching a substrate. The apparatus includes a pedestal 11 and a cover 12 forming a circular processing chamber 13 to house a substrate 14. (See, Fig. 3A; col. 3, lns. 1-4.) *Rothman et al.* does not qualify as prior art as discussed above. *Hembree et al.* discloses an etch tank 20 and a transducer mounted on a submersible rod 34 disposed directly within the etch tank 20. (See, Fig. 5.) The rod 34 is positioned away from the wafer boat 24 (See, Fig. 5.) As a consequence, the references, alone or in combination, do not teach, show, or suggest a transducer coupled to an evaporation shield adapted to be position over a substrate disposed on the substrate support. Withdrawal of the rejection is respectfully requested.

Claim 37 stands rejected under 35 U.S.C. § 103(a) over *Ohkuma* in view of U.S. Patent No. 6,027,602 (*Hung et al.*) on grounds that it would have been obvious to have provided an evaporation shield adapted to rotate in *Ohkuma* in order to create a stable processing environment where processing parameters are more easily controlled as taught by *Hung et al.* Applicants respectfully traverse this rejection on grounds that the references, alone or in combination, do not teach, show, or suggest an evaporation adapted to rotate independently of the substrate support.

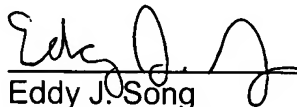
*Ohkuma* discloses an apparatus for wet processing of a substrate, such as washing or etching a substrate. The apparatus includes a pedestal 11 and a cover 12 forming a circular processing chamber 13 to house a substrate 14. (See, Fig. 3A; col. 3,

Ins. 1-4.) *Hung et al.* discloses a processing chamber 50 sealed by a cover 59. (See, Fig.1; col. 3, Ins. 42-50.) A pin holds the cover 59 to the chamber wall 50a such that the cover 59 rotates with the chamber 50. (See, Fig.1; col. 3, Ins. 42-50.) *Hung et al.* does not teach or disclose that the cover 59 may rotate independently of the wall 50a. Therefore, the references, alone or in combination, do not teach, show, or suggest an evaporation adapted to rotate independently of the substrate support.

Claims 39-40 stand rejected under 35 U.S.C. § 103(a) over *Ohkuma* in view of U.S. Patent No. 3,853,094 (*Christini et al.*) on grounds that it would have been obvious to provide an evaporation comprising polymeric material in *Ohkuma* in order to take advantage of the material's anti-corrosion properties as taught by *Christini et al.* Applicants respectfully traverse this rejection. Claims 39-40 dependent on allowable claim 19 as discussed above. As a consequence, withdrawal of the rejection is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed. Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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